C - 28

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : PROSIDING

Judul Karya Ilmiah	:	The Design of Connection Solid Oxide Fuel Cell (SOFC) Integrated Grid with Three-Phase Inverter		
Jumlah Penulis	:	3 Orang		
Status Pengusul	:	Penulis ke-2		
Identitas Prosiding	:	a. Judul Prosiding	:	IOP Conference Series: Materials Science and Engineering "Quality in Research: International Symposium on Materials, Metallurgy, and Chemical Engineering"
		b. ISBN/ISSN	:	Online ISSN: 1757-899X, Print ISSN: 1757-8981
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b. Ruang lingkup dan kedalaman pembahasan (30%)	8,50	8,80	8,65
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	8,50	8,75	~~8,65~~ 8,63
d. Kelengkapan unsur dan kualitas terbitan/prosiding(30%)	8,75	8,75	8,75
Total = (100%)	**28,25**	**28,80**	~~28,55~~
Nilai Pengusul = ~~(40% x 28,55)/2 = 5,71~~ (40% × 28,53)/2 = 5,71			28,53

Semarang,

Reviewer 2

Dr. Iwan Setiawan, S.T., M.T.
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Unit Kerja : Teknik Elektro FT UNDIP

Reviewer 1

Dr. Wahyudi, S.T., M.T.
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Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akhir Yang Diperoleh
	Internasional ☐	Nasional ☐	
a. Kelengkapan unsur isi prosiding (10%)	3,00		2,50
b. Ruang lingkup dan kedalaman pembahasan (30%)	9,00		8,50
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9,00		8,50
d. Kelengkapan unsur dan kualitas terbitan/prosiding(30%)	9,00		8,75
Total = (100%)	**30,00**		**28,25**
Nilai Pengusul = (40% x 28,25)/2= 5,65			

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4. **Kelengkapan unsur dan kualitas terbitan:** *Kualitas terbitan baik (terindex Scopus Q4).*

Semarang,

Reviewer 1

Dr. Wahyudi, S.T., M.T.
NIP. 196906121994031001
Unit Kerja : Teknik Elektro FT UNDIP

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b. Ruang lingkup dan kedalaman pembahasan (30%)	9,00		8,80
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9,00		8,75
d. Kelengkapan unsur dan kualitas terbitan/prosiding(30%)	9,00		8,75
Total = (100%)	**30,00**		**28,80**
Nilai Pengusul = (40% x 28,80)/2= 5,76			

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4. **Kelengkapan unsur dan kualitas terbitan:** *Kualitas terbitan baik, terindex Scopus tapi tidak ada versi printed.*

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IOP Conference Series: Materials Science and Engineering
Volume 316, Issue 1, 28 March 2018, Article number 012057
15th International Conference on Quality in Research, QiR 2017; Nusa Dua, Bali; Indonesia; 24 July 2017 through 27 July 2017; Code 135681

The Design of Connection Solid Oxide Fuel Cell (SOFC) Integrated Grid with Three-Phase Inverter (Conference Paper) (Open Access)

Darjat[a,b], Sulistyo[b], Triwiyatno, A.[a], Thalib, H.[a]

[a]Department of Electrical Engineering, Diponegoro University, Semarang, 50275, Indonesia
[b]Department of Mechanical Engineering, Diponegoro University, Semarang, 50275, Indonesia

Abstract

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Fuel cell technology is a relatively new energy-saving technology that has the potential to replace conventional energy technologies. Among the different types of generation technologies, fuel cells is the generation technologies considered as a potential source of power generation because it is flexible and can be placed anywhere based distribution system. Modeling of SOFC is done by using Nernst equation. The output power of the fuel cell can be controlled by controlling the flow rate of the fuels used in the process. Three-phase PWM inverter is used to get the form of three-phase voltage which same with the grid. In this paper, the planning and design of the SOFC are connected to the grid. © Published under licence by IOP Publishing Ltd.

SciVal Topic Prominence

Topic: Solid oxide fuel cells (SOFC) | Fuel cells | Electrical efficiency

Prominence percentile: 99.139

Indexed keywords

Engineering controlled terms: Electric inverters, Energy conservation

Engineering uncontrolled terms: Distribution systems, Energy technologies, Fuel cell technologies, Generation technologies, Planning and design, Potential sources, Three phase voltage, Three-phase inverter

Engineering main heading: Solid oxide fuel cells (SOFC)

Cited by 2 documents

A new model for constant fuel utilization and constant fuel flow in fuel cells

Chakraborty, U.K.
(2019) Applied Sciences (Switzerland)

Reversible and irreversible potentials and an inaccuracy in popularmodels in the fuel cell literature

Chakraborty, U.K.
(2018) Energies

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Design optimization of a SOFC-based CHP system through dynamic analysis

Barelli, L., Bidini, G., Gallorini, F.
(2011) EFC 2011 - Proceedings of the 4th European Fuel Cell Piero

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Preface

Papers

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OPEN ACCESS 012063

Anaerobic digestion of citrus waste using two-stage membrane bioreactor

Ria Millati, Lukitawesa, Ervina Dwi Permanasari, Kartika Wulan Sari, Muhammad Nur Cahyanto, Claes Niklasson and Mohammad J. Taherzadeh

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Effect of some variable in cellulase production by *Aspergillus niger* ITBCC L74 using solid state fermentation

Preparation of hollow mesoporous carbon spheres and their performances for electrochemical applications

T Ariyanto[1,2*], G R Zhang[2,3], A Kern[2], B J M Etzold[2,3]

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Abstract. Hollow carbon materials have received intensive attention for energy storage/conversion applications due to their attractive properties of high conductivity, high surface area, large void and short diffusion pathway. In this work, a novel hollow mesoporous material based on carbide-derived carbon (CDC) is presented. CDC is a new class of carbon material synthesized by the selective extraction of metals from metal carbides. With a two-stage extraction procedure of carbides with chlorine, firstly hybrid core-shell carbon particles were synthesized, i.e. mesoporous/graphitic carbon shells covering microporous/amorphous carbon cores. The amorphous cores were then selectively removed from particles by a careful oxidative treatment utilizing its low thermal characters while the more stable carbon shells remained, thus resulting hollow particles. The characterization methods (e.g. N_2 sorption, Raman spectroscopy, temperature-programmed oxidation and SEM) proved the successful synthesis of the aspired material. In electric double-layer capacitor (EDLC) testing, this novel hollow core material showed a remarkable enhancement of EDLC's rate handling ability (75% at a high scan rate) with respect to an entirely solid-mesoporous material. Furthermore, as a fuel cell catalyst support the material showed higher Pt mass activity (a factor of 1.8) compared to a conventional carbon support for methanol oxidation without noticeably decreasing activity in a long-term testing. Therefore, this carbon nanostructure shows great promises as efficient electrode materials for energy storage and conversion systems.
Keywords: Carbide-derived carbon, Electric-double layer capacitors, Hollow carbon spheres, Methanol oxidation

1. Introduction

Porous carbons play an important role in electrochemical applications. They have been used as electrode material of electric double-layer capacitors (EDLC) and catalyst support for fuel cell electrodes [1]. Hollow carbon spheres are types of structured carbon materials which have received much attention. This is due to their attractive properties of high surface area, large void and short diffusion pathway [2]. A common method to synthesize hollow carbon sphere is templating routes using polymeric materials as carbon precursors [3,4]. Nevertheless, with this method, typically a low degree of carbon ordering results (amorphous structures). Therefore, the produced material features

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Anaerobic digestion of citrus waste using two-stage membrane bioreactor

Ria Millati[1]*, Lukitawesa[2], Ervina Dwi Permanasari[1], Kartika Wulan Sari[1], Muhammad Nur Cahyanto[1], Claes Niklasson[3], Mohammad J. Taherzadeh[2]

[1]Department of Food and Agricultural Product Technology, Faculty of Agricultural Technology, Universitas Gadjah Mada, Jl. Flora Bulaksumur, Yogyakarta 55281, Indonesia

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Abstract. Anaerobic digestion is a promising method to treat citrus waste. However, the presence of limonene in citrus waste inhibits anaerobic digestion process. Limonene is an antimicrobial compound and could inhibit methane forming bacteria that takes a longer time to recover than the injured acid forming bacteria. Hence, volatile fatty acids will be accumulated and methane production will be decreased. One way to solve this problem is by conducting anaerobic digestion process into two stages. The first step is aimed for hydrolysis, acidogenesis, and acetogenesis reactions and the second stage is aimed for methanogenesis reaction. The separation of the system would further allow each stage in their optimum conditions making the process more stable. In this research, anaerobic digestion was carried out in batch operations using 120 ml-glass bottle bioreactors in 2 stages. The first stage was performed in free-cells bioreactor, whereas the second stage was performed in both bioreactor of free cells and membrane bioreactor. In the first stage, the reactor was set into 'anaerobic' and 'semi-aerobic' conditions to examine the effect of oxygen on facultative anaerobic bacteria in acid production. In the second stage, the protection of membrane towards the cells against limonene was tested. For the first stage, the basal medium was prepared with 1.5 g VS of inoculum and 4.5 g VS of citrus waste. The digestion process was carried out at 55°C for four days. For the second stage, the membrane bioreactor was prepared with 3 g of cells that were encased and sealed in a 3×6 cm^2 polyvinylidene fluoride membrane. The medium contained 40 ml basal medium and 10 ml liquid from the first stage. The bioreactors were incubated at 55°C for 2 days under anaerobic condition. The results from the first stage showed that the maximum total sugar under 'anaerobic' and 'semi-aerobic' conditions was 294.3 g/l and 244.7 g/l, respectively. The corresponding values for total volatile fatty acids were 3.8 g/l and 2.9 g/l, respectively. Methane production of citrus waste taken from the first stage under 'anaerobic' condition in membrane and free-cells bioreactors was 11.2 Nml and 7.2 Nml, respectively. Whereas, methane production of citrus waste taken from the first stage under 'semi- aerobic' condition in membrane and free-cells bioreactors was 8.8 Nml and 5.7 Nml, respectively. It can be seen

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Studies of the water adsorption on Lampung's natural zeolite of Indonesia for cooling application

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Abstract. Part of minerals that originally formed from volcanic rock and ash layers reacting further with alkaline groundwater is called natural zeolite, where its sources are not always available in all countries. Indonesia is located in the ring of fire which have a huge sources of zeolite, one of the area is Lampung, South Sumatra. Natural zeolite has been considered as one of potential heat adsorbent medium which can contribute to the energy consumption and reduce air pollution in the using of cooling application. The characteristic of this Lampung natural zeolite such as adsorption kinetics, adsorption water uptake, and adsorption capacity were test with ASAP 2020 system. Sorption kinetics by this experiment of zeolite samples were carried out in a constant temperature and humidity chamber. The chamber can supply constant air condition with deviations of ±0.5 °C for temperature and ±3% for relative humidity. The data based on rate of adsorption and the defined working condition was set as 20°C and 70% RH. Pore volume is a significant parameter for determining the limitation of water uptake, which can describe the saturated condition of zeolite. Sorption isotherm models used to describe sorption phenomena are commonly deduced from the Polanyi potential theory were investigated. The water adsorption quantity increased with the increase of relative pressure. To sum up, this pure zeolite has a less heat and mass transfer performance so its need to be activated before using in cooling application to get their great potential and by being coated in a desiccant heat exchanger systems.

1. Introduction

The use of natural zeolite from Indonesia as an adsorbent for cooling application can be a huge alternative energy resources for energy conservation and environmentally protection. Natural zeolites are scattered in several regions in Indonesia on more than twenty places in Indonesia among others in Sumatra, Java and East Nusa Tenggara because it's spread on the land near the volcanic mountains [1] with lots of mordenit and klinoptilolit type [2]. More research show that a lot of it using for other needs.

Nowadays, widely utilization of natural zeolite in Indonesia have been applied in agriculture, livestock, fisheries and some industries [3]. However, there is a research about natural zeolite in Indonesia as a adsorber in CO2 capture modified with Na+ to achieve the higher of adsorption capacity was conducted [4]. Besides, the research of chromium (VI) waste adsorption by zeolite has done by isotherm adsorption method to determine maximum capacity of zeolite to chromium (VI) waste [5]. Subsequent work by [6] and [6] show about conversion of palm oil into bio gasoline using Ni/ZA or natural zeolite catalyst and Cr/ZA catalyst on the conversion reaction of waste cooking oil into liquid fuel. In addition, the dehydration process on the bioethanol purification using natural zeolite result the purity more than 99% but has lower yield and much ethanol can be absorbed by natural zeolite from Gunung Kidul which could be seen from the addition of adsorbent weight by